

## ABSTRACT

Transcranial Magnetic Stimulation (TMS) is now a common diagnostic and treatment for many brain dysfunctions. A rapidly changing magnetic field induces an electric field which initiates an action potential. Ferromagnetic cores increase the efficiency of the stimulator unit. Choosing an optimal core size is a task which involves both the physics of fields as well as the physics of biostimulation. Both the inductance and resistance of the stimulator affect the induced transmembrane voltage. A technique is outlined for using a boundary element method to design an optimal stimulation core and an exemplary core devised by such technique is described.